



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/616,106	07/14/2000	Mark B. Solomon	SOL00-03	6526

7590

02/09/2005

SolVisions Technologies Int'l
82 Albemarle Road
Norwood, MA 02062

EXAMINER

GARLAND, STEVEN R

ART UNIT PAPER NUMBER

2125

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/616,106

Applicant(s)

SOLOMON, MARK B.

Examiner

Steven R Garland

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-71 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 1-15, 17-41, 43-61 and 63-67 is/are allowed.
6) ☒ Claim(s) 42, 62, 68, 70 and 71 is/are rejected.
7) ☒ Claim(s) 69 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 70 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 70, line 3, "the actuator" lacks a clear antecedent basis. It is suggested that "the actuator" be changed to -- said at least one actuator --.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 42 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gullapalli 6,424,076 in view of Ben-Yaakov WO 00/25368.

Gullapalli teaches a deformable mirror system, connecting different actuators of the mirror to different amplifiers, use of addressing circuitry, use of multiplexing, use of a processor, receiving data from an external system, providing commands to the amplifiers, current limiting, frame commands, and reducing power consumption.

Gullapalli also teaches the use of piezoelectric elements as actuators for the mirror.

Note col. 2, lines 49-53; col. 5, lines 53-65; claims 3 and 11 in regards to the use of piezoelectric elements. Also see the abstract, figures, col. 1, line 61 to col. 2, line 42; col. 5, line 10 to col. 6, line 59; col. 9, lines 24-48; and the claims.

Art Unit: 2125

Gullapalli however does not provide a switch connected between a reference node and the reference electrode with the switch enabling/disabling the actuator and also continuously supplying a signal to a signal electrode.

Ben-Yaakov teaches continuously supplying a signal to a signal electrode (17) of a piezoelectric element, use of MOSFET switches and diodes, and use of a switch for enabling/disabling connected between a reference node (ground) and a reference electrode (13,14) of a piezoelectric element. Ben-Yaakov specifically teaches that this arrangement allows soft switching, lowers switching losses, increases efficiency, and uses lower voltages. Note that the MOSFET and diode combination of Ben-Yaakov inherently provides two switches, but only the FET is selectively controllable. See the figures; page 2, lines 24-30; page 8, lines 16-29; page 8, line 30 on. Note in particular page 11, lines 5-14.

It would have been obvious to one of ordinary skill in the art to modify Gullapalli in view of Ben-Yaakov and continuously supply a signal to the signal electrode(s) of the piezoelectric actuator(s) of the mirror and control the switching between the reference node and reference electrode(s) of the mirror array so that lower switching voltages could be used, decrease switching losses, and increase efficiency as expressly taught by Ben-Yaakov.

In response to applicant's arguments, the rejected claims only require that the means for selectably enabling and disabling be defined by at least two means for combining to perform the enabling and disabling which is only broadly similar to the limitations claim 1 was amended to include. Note switches MS1 and MS2 of Ben-

Yaakov broadly perform such a function.

5. Claims 68,70, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Comstock 4,263,527 in view of Gullapalli 6,424,076.

Comstock teaches a deformable mirror having an actuator with electrodes, providing a command signal (output of 30) to a second electrode (top electrode of figure 3) to operate the mirror, driving an initial command signal to the second electrode (initialization mode in which 41 is connected to the damped oscillator 40; 35 is connected to 39; 34 is connected to ground) and after the initialization switch 34 is opened and the reference signal (voltage on capacitor 32) is applied to the bottom electrode. Comstock also teaches current limiting through the switches and Comstock teaches initialization of the mirror to a reference position (figure of merit) which conserves power. See figure 3 and col. 2, line 43 on. Note col. 3, line 44 to col. 4, line 7.

Comstock however does not expressly state that plural actuators are used.

Gullapalli teaches a multiple actuator deformable mirror, use of a processor, receiving data from an external system, providing commands to the amplifiers, current limiting, and reducing power consumption. See the abstract, figures, col. 1, line 61 to col. 2, line 42; col. 5, line 10 to col. 6, line 59; col. 9, lines 24-48; and the claims.

It would have been obvious to one of ordinary skill in the art to modify Comstock in view of Gullapalli to use a processor, multiple actuators, and current limiting so that an array of actuators in a deformable mirror could be easily and finely controlled,

Art Unit: 2125

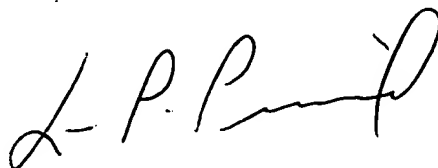
prevent damage, allow ease in initially configuring the mirror, reduce power consumption, and reduce hysteresis.

6. Claims 1-15,17-41,43-61, and 63-67 are allowed.
7. Claim 69 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven R Garland whose telephone number is 571-272-3741. The examiner can normally be reached on Monday-Thursday from 6:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard, can be reached at (571)272-3749. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S.R.G.
STEVEN GARLAND



LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100